

# **Contribution of the biopesticide industry in Italy**

*Il contributo dell'industria dei mezzi biologici di controllo*

massimo benuzzi

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IBMA Global (International Biocontrol Manufacturers' Association), is the largest world association of biocontrol companies, involved in production and distribution of :

1. Macrorganisms (Insects and mites, entomopathogenic nematodes);
2. Microorganisms;
3. Pheromones and pest control systems based on them;
4. Natural extracts

IBMA ITALIA constituted in 2006; actually 13 members



Assometab è una associazione di aziende che hanno come attività principale

la progettazione, la produzione e la distribuzione di mezzi tecnici per la

difesa integrata e biologica

Assometab è stata fondata in Italia nel 1999 ed composta da 11 aziende

## Who is the Biocontrol industry?

SMEs

Low profit

Very delicate and perishable products

Complicated logistic chain

Strong R&D approach

Investment based on proper resources

Rules complicated and not always clear

High technical level of HR

Intensive extension service

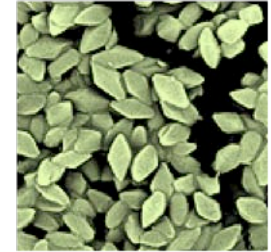
Relation with research institutes and organizations

Light multinational (network of national companies)

# Biocontrol in Italy – Microorganisms (MBCAs)

## Biocontrol of insects

- *Bacillus thuringiensis*
- *Beauveria bassiana*
- *Cydia pomonella granulosis virus*
- *Adoxophyes orana granulosis virus*



## Biocontrol of nematodes

- *Paecilomyces lilacinus*

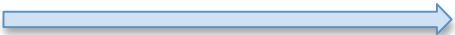



## Biocontrol of diseases

- *Ampelomyces quisqualis*
- *Bacillus subtilis*
- *Streptomyces griseoviridis*
- *Coniothyrium minitans*
- *Pseudomonas chlororaphis*
- *Trichoderma asperellum*
- *Trichoderma viride*
- *Trichoderma harzianum*




## Biocontrol of insects

- *Bacillus thuringiensis*  **> 130 tons/year**
- *Beauveria bassiana*
- *Cydia pomonella granulosis virus*  **40.000 dosis/ha/year**  
(probably largest use in the world)
- *Adoxophyes orana granulosis virus*

## Biocontrol of nematodes

- *Paecilomyces lilacinus*

## Biocontrol of diseases

- *Ampelomyces quisqualis*
- *Bacillus subtilis*  **> 40 tons/year**
- *Streptomyces griseoviridis*
- *Coniothyrium minitans*
- *Pseudomonas chlororaphis*
- *Trichoderma asperellum*
- *Trichoderma viride*
- *Trichoderma harzianum*



## Biocontrol in Italy Invertebrates (IBCA)



*Phytoseiulus persimilis*

*Amblyseius swirskii*



*Amblyseius cucumeris*

*Orius laevigatus*



*Anthocoris nemoralis*

*Macrolophus caliginosus*



*Nesidiocoris tenuis*

*Chrysoperla carnea*



*Adalia bipunctata*

*Cryptolaemus montrouzieri*



*Aphidius colemani*



*Diglyphus isaea*



*Encarsia formosa*



*Eretmocerus mundus*



*Neodryinus typhlocybae*

*Heterorhabditis bacteriophorae*

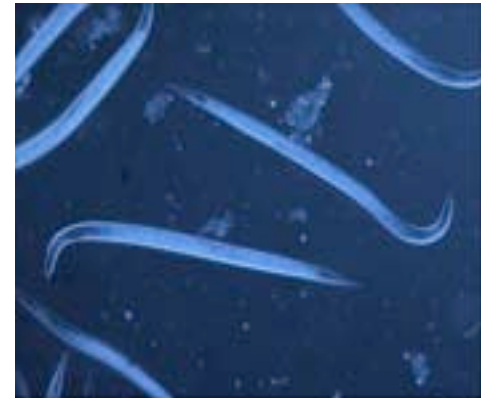
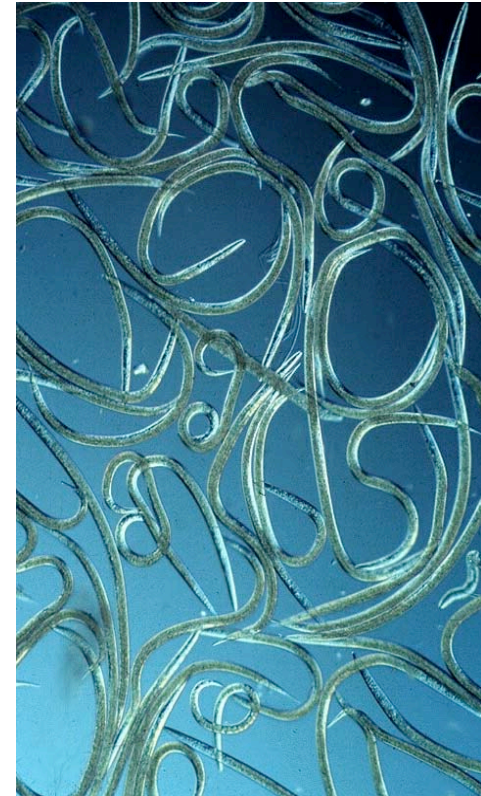
*Heterorhabditis megidis*

*Steinernema feltiae*

*Steinernema carpocapsae*

*Steinernema kraussei*

*Phasmarhabditis hermaphrodita*





## main applications of macrorganisms in Italy

*Frankliniella occidentalis*

Pepper, strawberry

*Tetranychus urticae*

Strawberry, pepper, eggplant, cucumber, melon,

Aleurodidi

Tomato, eggplant, cucumber  
hornamentals, rose

Afidi

Cucumber, melon, strawberry, pepper

*Liriomyza spp.*

Tomato, eggplant, hornamentals

Psylla

Pear

Mealybugs

Citrus, hornamentals

Weevils and sciarids

Hornamentals



# main applications of macrorganisms in Italy

**less than 600 ha**





## Mating disruption in Italy

**29.000** ha pome fruits (*cydia pomonella*, *c.molesta*)

**18.000** ha stone fruits (*cydia molesta*, *c.funebrana*,  
*anarsia*),

**15.000** ha grape (*lobesia botrana*, *eupoecilia ambiguella*)



## **BIOCONTROL & IPM**



## Main advantages

- Control of pesticide resistant pest
- Easy application
- Less contaminants in the environment
- Safer for workers
- Less residues in food
- Added value to the agriculture products
- Respect of agroecosystems
- Zero or short, time to harvest
- No risk of resistance

## EU definition of IPM

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The new EU definition in Regulation concerning the placing of plant protection products on the market (2009) based on the new FAO definition provides an appropriate and recommendable definition:

*“**Careful consideration of all available pest control techniques** and subsequent **integration of appropriate measures** that discourage the development of pest populations and keep plant protection products and other interventions to levels that are **economically justified** and **reduce or minimise risks to human health and the environment**. IPM emphasises the growth of a healthy crop with the least possible disruption to agro-ecosystems and encourages natural pest control mechanisms.”*

## Biocontrol and Sustainable Use Directive

"difesa integrata”:

...considerazione di tutti i metodi di difesa ed integrazione di misure per scoraggiare lo sviluppo degli organismi nocivi e mantenere l'uso dei prodotti fitosanitari a livelli giustificati in termini economici ed ecologici e che riducano i rischi per uomo e ambiente.

Obiettivo prioritario della difesa integrata è la produzione di colture sane con metodi che perturbino il meno possibile gli ecosistemi agricoli e che promuovano i meccanismi naturali di controllo fitosanitario;



## Biocontrol and Sustainable Use Directive

+ PF su strade, ferrovie, superfici permeabili .... eliminato o fortemente limitato  
...

+ Divieto e/o regolamentazione uso PF in parchi e giardini pubblici, campi sportivi, scuole, strutture sanitarie.

+ Definizione e rispetto del tempo di rientro

+ PF ridotti al minimo o vietati in aree naturali protette

+ entro il 2014 assicurare applicazione principi IPM;

+ incentivi e soluzioni per applicare su base volontaria la difesa integrata;

+ favorire diffusione dell'agricoltura biologica.

+ studio e ricerche per il potenziamento utilizzo ausiliari nei programmi IPM (bio intensive IPM);

+ messa a punto criteri valutazione univoci selettività PF





## Biocontrol and Sustainable Use Directive

Predisposizione manuale difesa integrata con le soluzioni a basso impatto quali ad esempio:

- gestione del terreno
- rotazioni
- monitoraggio parassiti
- modelli previsionali
- salvaguardia biodiversità
- valorizzazione e salvaguardia ausiliari (indicazioni su selettività PF);
- soluzioni tecniche adottate in agricoltura biologica (*Bacillus thuringiensis*, confusione sessuale, virus... ecc.).
- criteri per limitare lo sviluppo di ceppi resistenti.



## Biocontrol and ENDURE

### **ENDURE:**

Introducing innovative strategies and ***reducing reliance on pesticides.***

The aim is to ***reduce*** the use of ***chemical*** pesticides, .....

IPM creates synergies by integrating complementary methods drawing from a diverse array of approaches that include ***biocontrol*** agents, plant genetics, cultural and mechanical methods, biotechnologies, and information technologies, together with some pesticides that are still needed to address the most problematic pests and face critical situations.



## IPM and Biological Control

- Biocontrol plays a key role in a modern IPM
- IPM can not be a simple list of conventional and biocontrol methods
- There is only an IPM
- Biocontrol and Organic farming not in biunivocal correspondence
  - Biocontrol mainly applied in conventional agriculture
  - Organic farming not necessarily with biocontrol
- Biocontrol as tool of pesticide resistance prevention
- Positive coevolution of Biocontrol and Chemicals
  - Biologicals need to be more and more efficient to replace chemicals
  - Chemicals need to be more and more clean to resist in the system

**The best product with least possible chemicals**

## Limits to the development of Biocontrol in Italy (?)

- Climatic conditions
- Mixed cropping and external source of infestation
- High virulent pest
- Zero thresholds due to Virus transmission
- Ineffective logistic and distribution chain
- Lack of planning
- Many chemicals products on the market
- “Heterogeneous” extension service
- Poor environmental culture
- Diffused illegality / Lack of controls



## What is gone well in Almeria



## What is gone well in Almeria

More than 10,000 ha converted to biocontrol in one season (2007)

- Market crisis / export blocked
- Strong repression of illegal pesticides
- Steady intervention of regional institutions
- Economic subvention to control virus vectors
- Intensive grower training program
- Strong cooperation with Biocontrol companies
- Availability of effective BCAs
- Availability of other IPM tools (virus, BT, compatible chemicals)
- Retailers actively involved in the program
- International marketing and promotion of clean Almeria
- Good market remuneration of vegetables
- Everybody happy



## WANTED

- 1.high production yields
- 2.high standard of quality
- 3.absence of contaminants (aflatoxines ecc.) in food
- 4.no chemical residues in food

But the only solution: **biocontrol** based IPM, is not encouraged



**What will be the future for Biocontrol?**





- Registration at EU level and commercial distribution are big issues
- Competition with older & cheaper chemicals is difficult
- Help can be expected by
  - Restriction of chemicals
  - Accurate control of pesticide abuses and residues
  - Development of (real) Organic Agriculture
  - Real IPM, biointensive IPM, advanced IPM
  - Adapted Efficacy standards
  - Proper authorization procedures
  - Full Rank of the Biocontrol in the local IPM guidelines
  - Tariff on heavy pesticides to support R&D and clean alternatives



## **CONCLUSIONS**



***GRAZIE  
PER  
L'ATTENZIONE***